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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,620	09/29/2004	Dae-You Kim	3260-25	1008

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EXAMINER	
GUDIBANDE, SATYANARAYAN R	
ART UNIT	**PAPER NUMBER**
1654	

DATE MAILED: 09/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/509,620	KIM ET AL.	
	Examiner	Art Unit	
	Satyanarayana R. Gudibande	1654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-16 and 18-22* is/are pending in the application.

4a) Of the above claim(s) *17* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) *1-16 and 18-22* is/are rejected.

7)☒ Claim(s) *15 and 16* is/are objected to.

8)☒ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☒ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *9/29/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Applicant's election with traverse of election of species of SEQ ID NO: 1 in the reply filed on July 29, 2005 is acknowledged. The traversal is on the ground(s) that the presently claimed invention relates to novel peptides, referred to as cytoplasmic transduction peptides (CTP) which exhibit superior transduction potential and a strong tendency to remain in the cytoplasm without migrating into nucleus. This is not found persuasive because, in the present instance all the inventions are drawn to cytoplasmic transduction peptides. The peptides do not share a common chemical structure and they are not an art-recognized class of compounds. Therefore, the requirement is still deemed proper and is therefore made FINAL.

Applicants have elected SEQ ID NO: 1 as a species. Claims 17 withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to containing a nonelected species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on July 29, 2005.

Claim Objections

Claims 15 and 16 objected to because of the following informalities: Claims contain letter L in referring the SEQ ID NO's. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7 and 10-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Wouters-Tyrou, et al., (J. Biol. Chem. 1991, 266, 17388-95).

In the present instance, applicants claim cytoplasmic transduction peptides (CTP) represented by the general formula "A-X_1-X_2-B-X_3-X_4-X_5-X_6-X_7-X_8". Applicant's election of species as SEQ ID NO: 1 is free of art. Upon further examination, Examiner found that SEQ ID NO: 14 is known in the art (Ref: Wouters-Tyrou, et al., J. Biol. Chem. 1991, 266, 17388-95). Wouters-Tyrou, et al. teaches the presence of SEQ ID NO: 14 in cuttlefish spermatid-specific protein variant T1 (page 17391, figure 2, amino acids 48-57). In the absence of clear definition for the phrase "at or near the N-terminal of its a-helix region" as recited in claim 3, the glycine at amino acid position 20 in Figure 2 on page 17391 meets the limitations of claims 1-7 and 10-16.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-13 and 18-22 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for synthesis and use of few representative peptides as cytoplasmic transduction peptides, does not reasonably provide enablement for the class of peptides represented by the general formula "A-X_1-X_2-B-X_3-X_4-X_5-X_6-X_7-X_8". The specification does not enable any person skilled in the art to which it pertains, or with which it is

most nearly connected, to making and using the invention commensurate in scope with these claims.

The factors to be considered in determining whether a disclosure meets the enablement requirements of 35 U.S.C. 112, first paragraph, have been described in *In re Wands*, 858 F.2d 731, 8 USPQ2d 1400 (Fed. Cir., 1988). The court in Wands states, "Enablement is not precluded by the necessity for some experimentation, such as routine screening. However, experimentation needed to practice the invention must not be undue experimentation. The key word is 'undue', not 'experimentation'" (Wands, 8 USPQ2sd 1404). Clearly, enablement of a claimed invention cannot be predicated on the basis of quantity of experimentation required to make or use the invention. "Whether undue experimentation is needed is not a single, simple factual determination, but rather is a conclusion reached by weighing many factual considerations" (Wands, 8 USPQ2d 1404). Among these factors are: (1) the nature of the invention; (2) the breadth of the claims; (3) the state of the prior art; (4) the predictability or unpredictability of the art; (5) the relative skill of those in the art; (6) the amount of direction or guidance presented; (7) the presence or absence of working examples; and (8) the quantity of experimentation necessary.

While all of these factors are considered, a sufficient amount for a *prima facie* case is discussed below.

(1) The nature of the invention and (2) the breadth of the claims:

The claims are drawn to design, synthesis and use of peptides as cytoplasmic transduction peptides. Claims as recited, and as represented by the general formula "A-X_1-X_2-B-X_3-X_4-X_5-X_6-X_7-X_8" is characterized by having a cell membrane transduction potential and the peptides once inside the cell remain in the cytoplasm. Thus, the claims taken together with the specification imply that the synthetic peptides as designed impart structural features to the peptide molecule for it to be able to enter the cell and remain in the cytoplasm without entering the nucleus. It is well known in the prior art that incorporation of positively charged amino acids increases the transduction potential of the peptide (Ho, et al., 2001, Cancer Research, 61, 474-7). However, according to the specification (page 26, lines 4-25) variable results were seen with respect peptides that conform to the aforementioned general formula and synthetic design.

(3) The state of the prior art and (4) the predictability or unpredictability of the art:

The prior art recognizes that peptides that are comprised of positively charged amino acids exhibit membrane transduction potential (Ho, et al., 2001, Cancer Research, 61, 474-7). Modification to the peptides as recited in the claims of the present application, "wherein said cytoplasmic transduction peptide comprises α-helix formation-enhancing amino acids having a positively charged R-group as a pivotal amino acid", and "wherein said cytoplasmic transduction peptide comprises at or near the N-terminal of its α-helix region an amino acid exhibiting relatively high freedom at the ϕ and ψ rotations of a peptide unit", introduces unpredictability. Since the prediction of the structure and function of the modified peptide remains largely unsolved, means for using the same for enhancing the membrane transduction potential combined with retention of peptide in the cytoplasm remains highly unpredictable.

(5) The amount of direction or guidance presented and (6) the presence or absence of working examples:

The specification has provided description for design, synthesis and method of use of several peptides having membrane transduction potential. However, with the exception of CTP512 (SEQ ID NO:1), all other peptides exhibits membrane transduction potential less than or equal to that of protein transduction domain (PTD) peptide (page 26, lines 4-25).

(7) The quantity of experimentation necessary:

The specification discloses design, synthesis and use of peptides with membrane transduction potential. With the lack supporting evidence in the specification for the phrase "at

or near" in describing the N-terminal α-helix region of the cytoplasmic transduction peptides, for one skilled in the art it would require a lot of experimentation to synthesize peptides with all possible combinations of peptides to look for the desired biological activity. Hence, considering the state of the art as discussed by the applicants and the high unpredictability and the lack of guidance provided in the specification, one of ordinary skill in the art would be burdened with undue experimentation to practice the invention to enhance the membrane transduction potential of peptides.

It is the Examiner's position that one skilled in the art could not practice the invention commensurate in the scope of the claims without undue experimentation. It is also noted, considering the *a priori* unpredictability in the art with regard to modification of the peptide to alter the structure and function of the peptides that would enhance the membrane transduction potential is not enabled.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 2, 3, 7 and 8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically:

Claim 2 recites, "A transduction peptide comprises α-helix formation-enhancing amino acids having a positively charged R-group as a pivotal amino acid". It is not clear from the claim as to what is the position of this "pivotal" amino acid in the peptide sequence.

In claim 3, it is unclear about the phrase "at or near", and what it refers to, with respect to the N-terminal α-helix region of the peptide. It is unclear as to how far, or how near, this amino acid should be located in the sequence at the N-terminal to fall within the scope of the claim.

The general formula "A-X_1-X_2-B-X_3-X_4-X_5-X_6-X_7-X_8" as recited in clam 7 does not define letter "B" as to what it represents.

Information Disclosure Statement

The information disclosure statement filed September 29, 2004 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

Conclusion

The elected species SEQ ID No: 1 is free of art and hence is allowable subject matter, no claim is limited to SEQ ID NO:1.

Claims are 1-16 and 18-22 are rejected. Claim 17 withdrawn from consideration.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Satyanarayana R. Gudibande whose telephone number is 571-272-8146. The examiner can normally be reached on M-F 8-4.30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bruce Campell can be reached on 571-272-0974. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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